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For
THIRD
and
FOURTH
Grades

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LOS ANGELES CITY

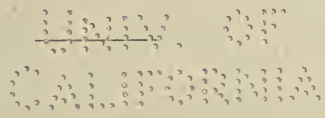
PUBLIC SCHOOLS

MANUAL

OF

CARDBOARD CONSTRUCTION

FOR THIRD AND FOURTH GRADES



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BY CHARLES A. KUNOU

K8

The author is not conscious of indebtedness to any books or authors in arranging the courses in this manual, except in that a man may be impressed, in a general way, by what he reads. The illustrations and drawings are just as good as he can make them. The work is not a modification of other systems used elsewhere.

It is hereby dedicated to the children and teachers of the third and fourth grades of Los Angeles City Public Schools.

CHARLES A. KUNOU.

Los Angeles, Cal., March, 1902.

UNIV. OF CALIFORNIA

Introduction.

This manual, prepared by Mr. Charles A. Kunou, is the outgrowth of practical experience in the school room, and is designed to assist teachers of the third and fourth grades who have not had special preparation. The aim is to make the work as simple as possible, and to establish a correlation with other subjects, particularly arithmetic and geometry; and to this end the exercises are intended to assist the mental as well as the moral growth. The progression is methodical, the exercises are simple, and the materials are not expensive. The work is intended to produce useful articles which are the creative work of the child, instead of merely flat pieces of paper with names attached. The using of paste is avoided as much as possible, and a system of "flaps" in combining surfaces is employed.

Cardboard construction has a definite educational value, because it stimulates the mental activities of the children. It calls into play brain energies which ordinary school systems do not develop in these grades. It inculcates habits of originality, accuracy, observation and neatness.

These courses prepare and lead to the more extensive work in the higher grades, in that they gradually train in definiteness of form and dimensions. They are planned to cover a period of two years, with two classes in a room, giving forty minutes each week for ten months in the year.

Printed by order of Board of Education.

JAMES A. FOSHAY,
Superintendent.

236836

General Directions.

The following courses have been planned for the Third and Fourth grades. They are four consecutive courses to be applied in the B3, A3, B4 and A4 classes, respectively. Although apparently separate, their inner organic connection constitute them one continuous course.

The sequence ought not to be broken, because the work is built up on its inner elements, i. e., a mere external view of the course does not wholly convey a complete idea of what it contains. In other words the models are built on exercises graded and arranged according to the nature and difficulty of performance. A distinction is made between a model and the exercises contained or united in the model. A model is one thing; an exercise is another, and a different thing. A model is the unit of expression of the set of exercises united in it. An exercise is a mental and physical effort as applied in the manipulation of tools and materials. Hence the course is a systematic unit for the simultaneous mental and manual training of the children.

Paper (cardboard, cover paper, bristolboard, tagboard, etc.) is a convenient medium of expression because:

1st. It encourages and trains in neatness and cleanliness.

2nd. It requires and admits the use of few tools in its extensive application.

3rd. It engenders artistic sense and taste by reason of its easy application in the production of real and ornamental articles.

4th. It is real and useful.

B3 COURSE.

The predominant geometric elements or motives are the square and the rectangle. These are studied and elaborated by indirect repetition, i. e., repetition on advanced and varied problems; going step by step from the easy to the difficult, from the simple to the complex, from the known to the unknown. This repetition is not apparent to nor felt by the pupils, as each repetition involves new cognitions, new truths and new applications of the original elements. In this course all measurements are limited to the discrimination of inches and half inches.

The tools and materials used in B3 Course are lead pencil, ruler, right angled triangle, scissors, darning needle, linen floss or Columbia zephyr and paper.

Eyelets and eyelet punch are used to a limited extent.

A3 COURSE.

This course is based and enlarged upon the geometric motives, the circle and triangles, and as in the preceding course these constructions are repeated and applied under new and varied circumstances, each step increasing in difficulty of performance and complexity of nature.

In the A3 Course the same tools and materials are used as in the B3 Course, adding pencil-compasses and paper fasteners. Measurements are inches, half inches and quarter inches.

Eyelets and eyelet punch are used to a limited extent.

B4 COURSE.

In this course the square and rectangle (oblong) are applied in advanced work, and tools and materials are the same as in the preceding course.

A4 COURSE.

This course combines in its exercises many of the elements of the preceding courses and involves construction of polygons such as hexagons and octagons. In this course the same tools and materials are used as in the preceding courses, adding paste.

Knives may be used in the latter part of the Fourth Grade, on supplementary work. No covered work or so called book binding should be attempted as required class work. Some little surface pasting is done in attaching fancy paper to the outside of some finished models.

All measurements are limited to inches, half inches and quarter inches.

In all work, teachers should observe and gather materials and suggestions for improvements of the course. Such suggestions should be in the line of simplification and concentration.

EXPLANATION.

The drawings in this manual were made so that the figures for dimensions were to be read from the bottom and from the right hand side. The arrangement of the cuts compelled a change of position in many instances.

SUGGESTIONS IN METHOD OF TEACHING.

General Method.

Always draw the outline common to the entire figure before spacing and drawing details of the inside. Whatever shape or form a figure may have, there is always some geometric motive and some regular outline defining and embodying it, so that where the inner details of a figure depend on the motives or outlines of a circle, a square or a rectangle, these latter must be drawn first. Proceeding from without, inward.

Reduced to a principle, the method may be stated thus:—Consider the outline, divide into definite spaces to obtain proportions and symmetry.

This method may be called synthetico-analytical method.

How to Teach.

1st. Construct and develop accurately the whole model on the blackboard, dictating at the beginning every step in the geometric process. Do not expect the pupils to *think out* mathematical constructions. Few *men* can construct a polygon unless shown how.

2nd. Use model, explaining the relation of it to the drawing and its parts.

3rd. As the work progresses, dictation of specific steps is reduced to general statements. Pupils can copy from chart or blackboard drawing.

4th. In beginning the B3 Course, give a lesson or two involving the use of the triangle and ruler only. For example: On a piece of practice paper draw lines 1" apart and ½" apart. Space 1" and ½" and draw lines 1", 1½", 2", 2½", 3", 3½", etc., so that the pupils understand how to discriminate between one inch and one half inch, and how to draw parallel lines. When pupils are thus able to draw lines at given distances, parallel and at right angles, the drawing is performed directly on the cardboard.

In beginning the A3 Course practice with compasses on "practice paper" before applying directly on cardboard.

5th. Where pupils have finished the prescribed work, encourage original work.

6th. In all manual school work the success is assured, or it is made impossible, by the foundations laid through the first lessons. Hold back instead of urging on. Resist the "what is next," the "I want to make the next model." Do not *require* quantity, but *demand* quality, and obtain it by arousing the pupils from within; by evoking the will. This will, to do, to make, is the dawn of intelligence, the first steps of education.

7th. *Regarding the system of lines used in this manual.* In written language, words are made up of letters. In Linear drawing the different lines are the letters, the alphabet, by which the drawings

are read. In teaching in the third and fourth grades, it is too early to attempt the application of different lines, by the children. The teacher should draw the figure on the blackboard in ordinary "full" lines, and frequently apply "dimension" lines. Lines to be scored should be filled in with colored crayon, red or blue. In this way the blackboard drawing will present sharp contrasts in the lines. Children should draw only ordinary lines, heavy and light. Remember that other advanced forms of manual work and mechanical drawing follow the work of the grades for which this course is designed.

CUTTING.

The pupils should be shown how to use the scissors properly and all should sit upright, using only the hands. Counteract the habit of twisting the mouth, inclining the head, projecting the tongue, etc.

PASTING.

In using paste or glue, pupils should supply themselves with small pieces of clean white cloth or soft paper to smooth down flaps, wipe the fingers, etc.

FOLDING.

Pupils should be taught to fold the paper in accordance with an approved method. Use ruler upon the line, and fold upward and toward "you," with ruler as guide and rest. Remove ruler, fold over and smooth down with fingers, then raise the paper to the angle required.

SCORING.

Scoring is the process of making an impression on the figure lines on the heavier papers, such as bristolboard, tagboard, or pulpboard. It should be done with some instrument not quite so sharp as a knife; for the paper must not be cut.

The back edge of the scissors is, in these courses, the most convenient for pupils. Otherwise a bookbinder's paperfolder is the best tool for hand scoring. Score only such paper whose thickness or folding quality requires scoring. Score *on* the lines and fold the figure *in* on the same side, except where using heavy bristol or pulp boards, and where edge binding is required.

TERMINOLOGY.

In all work use geometric terminology, that is: apply the names perpendicular, horizontal, vertical, oblique, circumference, radius, diameter, apex, base, etc. Use the (seconds) " in dimensions on drawings. Do not use the abbreviation "in." for inches. However, do not expect or attempt too much in this direction at the outset. As the pupils' work progresses, and the terms are frequently applied, they become distinct and fully understood by the pupils.

ORIGINAL AND SUPPLEMENTARY WORK.

Reading is taught for the purpose of developing children, and so is arithmetic, writing and music. Children are not employed, it is presumed, in these subjects "to see what can be done in these lines." Therefore, cardboard construction should be used as a means of formal education. Thus in giving supplementary work, models whose elements are co-related to other school work, say geometry, should be encouraged. The simple solids, the cube, cone, and pyramid are here conveniently applied. In all manual work in the public schools, the utilitarian side is, therefore, subordinated to the intellectual.

System or organized effort must exist in the schools. Individualism is not subverted by systematic efforts on the part of all in the class. The faculties of individuals are developed by doing a definite thing at and in a definite time and as required. Much of so-called original work combine efforts which are directed always in the channels offering least resistance and when completed result either in weariness or false self-satisfaction. Original work should be encouraged only where pupils have finished the prescribed work, so that it expresses their highest efforts, making the original work a privilege. In such cases the work should be formed into problems to be solved. That is, the pupil suggests to the teacher "what" he desires to make. Then a drawing is made, and the model worked out as other exercises in the course.

MATERIALS AND TOOLS USED IN THESE COURSES.

Paper.

NAME OF PAPER	SIZE	WEIGHT	COLOR
Cover Paper (Bordeaux Cover Wove Antique)	20x25 inches	60 lb. (500 sh.)	Assorted: Terra Cotta, Sapphire, Olivene, Jade, Gold
Bristolboard (Clinton)	22½x28½ inches	120 lb. (500 sh.)	
Tagboard	22½x28½ inches	140 lb. (500 sh.)	Assorted
			Manila

PASTE.

Paste is used very little and in the A4 Course only. The paste used is Sanford's Library Paste in 2 oz. bottles.

OTHER MATERIALS.

Dennison's Paperfasteners, No. 22, round head.
Eyelets and punch.
Darning needles 3".
Linen floss.
Excelsior Pencil Compasses No. 8999, Keuffel & Esser Co.
Scissors 5".
Triangles 30° and 60°.
Ruler, brassbound.
Sandpaper, No. 1, for supplementary work only.

HOW TO CUT SANDPAPER.

Sandpaper must not be cut with scissors in the ordinary way. The small silicon particles will dull the edges of the scissors. Draw the figure required on the back of the sandpaper, that is, on the smooth side. Then, using ruler—on straight lines—slide the scissors along it with the back side of the points in the lines to be cut out. It is not necessary to cut clear through so as to come in contact with the sand. Thus cut, the sandpaper parts or breaks easily.

SYSTEM OF LINES USED IN THESE COURSES.

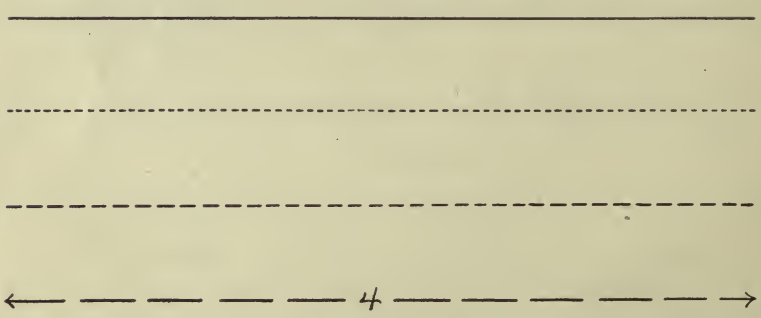
Line 1. Ordinary or full line, outline, to be cut.

Line 2. Dotted line, construction line, help line; to obtain figure, not to be scored.

Line 3. Dashed line, to be scored, not cut.

Line 4. Dimension line, to indicate size of figures and parts thereof.

(Pupils should draw their figures in ordinary lines only.)



B3 COURSE.

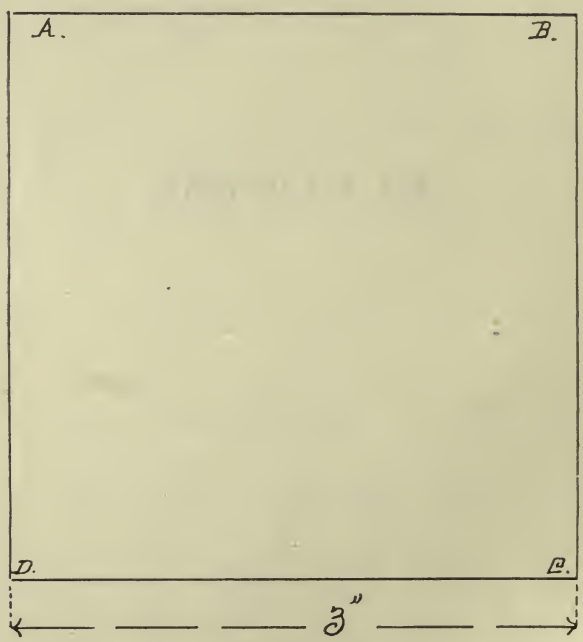
B3 COURSE.

No. 1. Square.

Construction:

With ruler draw AB, 3" long.
With triangle draw lines at right angles with A and B.
Measure BC and AD, 3".
With ruler draw DC parallel to AB.
Test the angles with triangle.
Cut with scissors.
Drill carefully the elements or concepts of the square.

Materials: Tagboard or bristolboard.



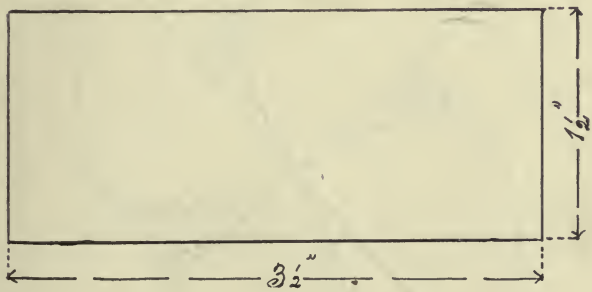
B3 COURSE.

No. 2. Visiting-card. Rectangle.

Construction:

With ruler draw line A B, 3½".
With triangle draw lines AD and BC at right angles to A and B.
Measure AD and BC, 1½".
With ruler draw DC parallel to AB.
Test angles with triangle.
Cut card with scissors.
Drill concepts of oblong (rectangle) contrasting with square.

Materials: Bristol or tagboard.



B3 COURSE.

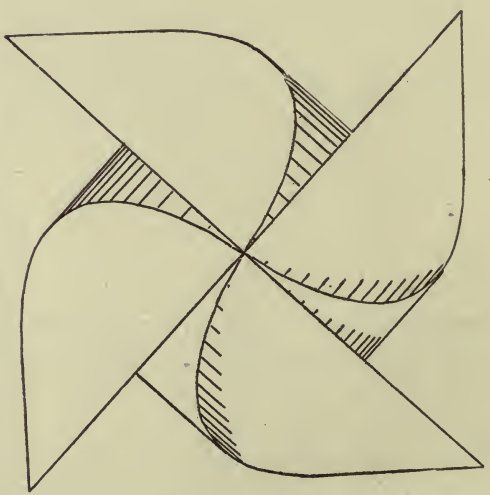
No. 3. Windmill.

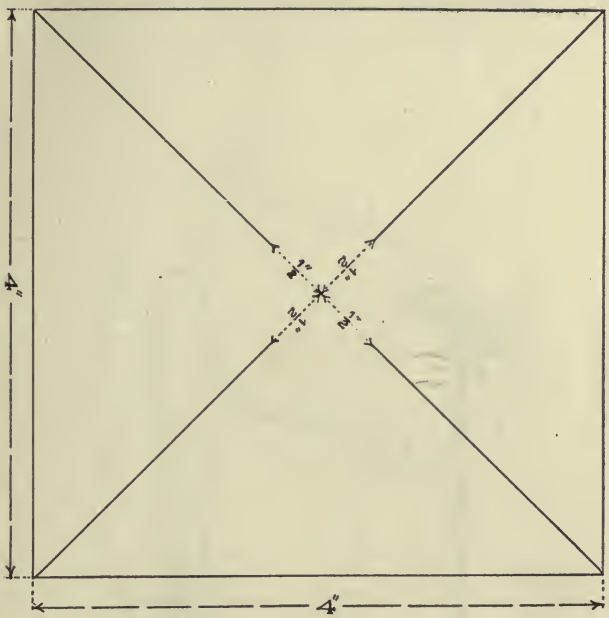
Construction:

With ruler and triangle draw square 4" sides.
Draw diagonals. Teach meaning of diagonals.
Measure ½" from center on each diagonal.
Cut out square with scissors.
Cut on each diagonal to the ½" mark, as in drawing.
Roll right hand corner over and upward, as in sketch.
Insert a pin through ends of wings and center of square.

Materials: Coverpaper and pin.

The windmill is one of the first devices to utilize the wind as a motive power. The earliest attempts were made in the eighth century.




4"
4"
1"
2
1"
2
1"
2
1"
2

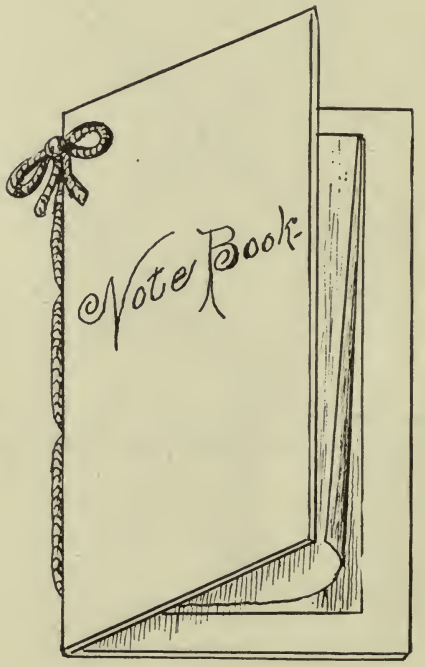
B3 COURSE.

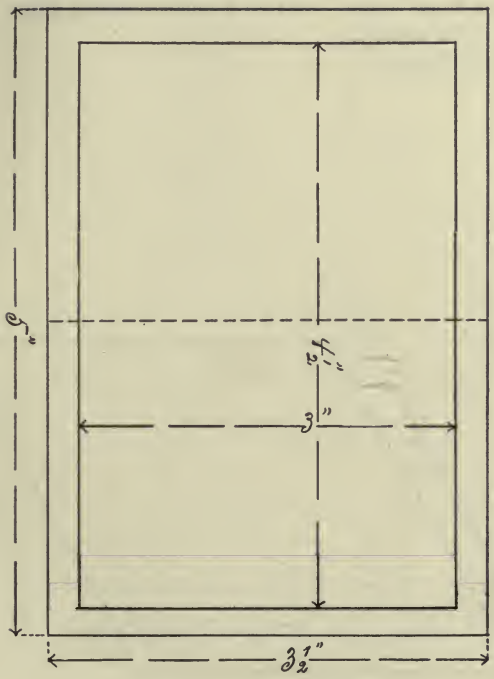
No. 4. Note book.

Construction:

Draw a rectangle 5"x3½".
Draw a line across in the middle.
Cut out figure with scissors.
Fold on middle line.
On white "soft paper" draw rectangle for leaves 4½"x3".
Cut around and fold in middle.
Sew the leaves on to the covers, using floss, taking two or three stitches as may be necessary.

Material: Bristolboard for covers, common soft paper for leaves.




9"
4½"
3"
3½"

B3 COURSE.

No. 5. Visiting card.

(Rhombus.)

Construction:

Draw base line of desired length.

Using the hypotenuse of a 60° triangle (or any angle) draw sides of rhombus equal to base line, measuring with ruler.

Draw top line parallel to base line, using ruler.

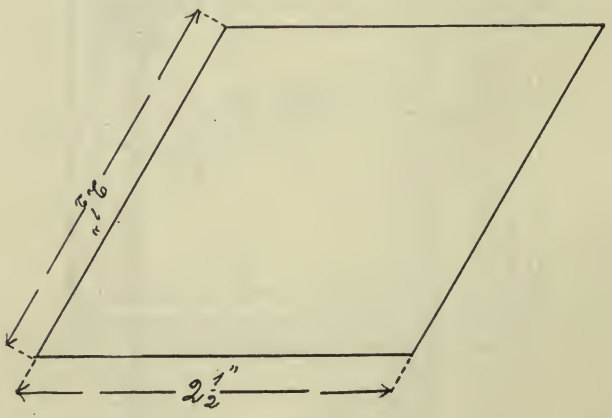
Cut out figure with scissors.

Let pupils write their names in the middle of the cards.

Teach elements of quadrilateral parallelograms,—that is, Rhombus has four equal sides, and two opposite angles equal.

Contrast with square.

Material: Bristolboard.



B3 COURSE.

No. 6. Visiting card.

(Rhomboid.)

Construction:

Draw base line of desired length.

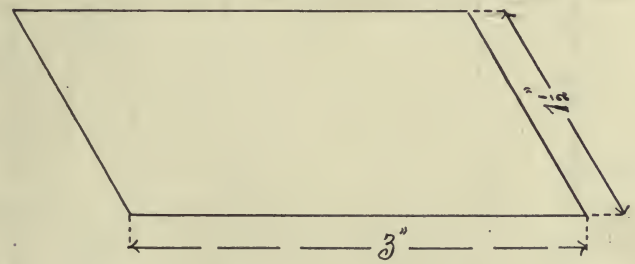
Using the hypotenuse of a 60° triangle draw sides of rhomboid of desired length, measuring with ruler.

Draw top line with ruler and parallel to base line.

Let pupils write their names in the middle of the cards.

Teach elements of quadrilateral parallelograms, as in preceding lesson. Contrast with rectangle and rhombus.

Material: Bristolboard.



B3 COURSE.

No. 7. Cardcase.

Construction:

Draw a rectangle $7\frac{1}{2}$"x$3\frac{1}{2}$".

Draw lines across 1", $1\frac{1}{2}$" and $2\frac{1}{2}$" as in drawing.

In the 1" space draw the tongue $\frac{1}{2}$" wide, by measuring $1\frac{1}{2}$" from each side of rectangle.

Mark off $\frac{1}{2}$" on the corners on the 1" line and draw oblique lines, as shown in drawing.

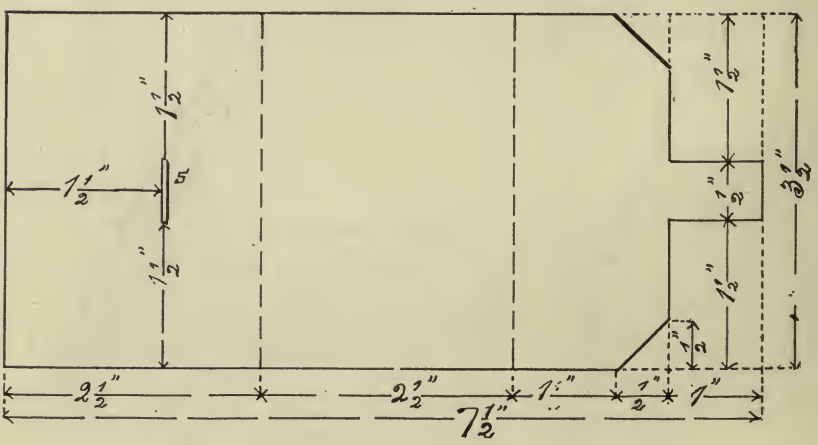
Draw lines for the slot opposite the tongue, and as long as the width of the tongue, and as indicated in the drawing.

Cut out figure with scissors.

Score and fold on dashed lines.

In cutting the slot, bore hole in the ends of the lines with a needle or other pointed instrument before inserting the scissors.

Material: Tagboard.



B3 COURSE.

No. 8. Wallpocket.

Construction:

Draw a horizontal line 8" long.

Draw a vertical line (at right angles) 8" long and in the middle of the horizontal line.

Connect the ends of these lines, completing a square, standing on its diagonal.

With triangles draw lines x, x, 4" long at right angles to the horizontal diagonal.

Draw the base line parallel to the horizontal diagonal and through the extremity of the vertical.

Draw flap lines ½" below base line.

Make ends of flaps oblique as shown in drawing.

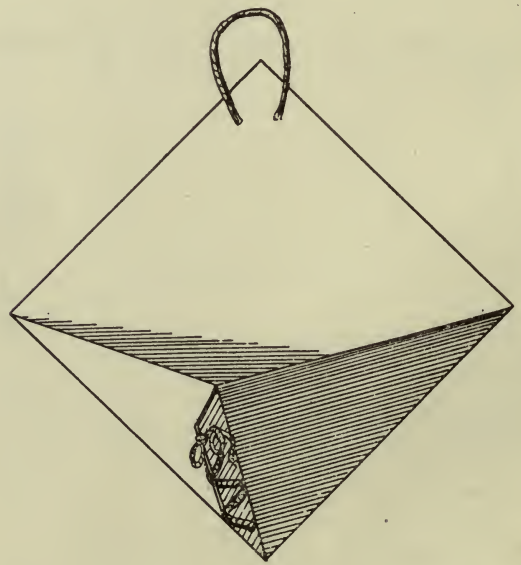
Cut around figure on full lines.

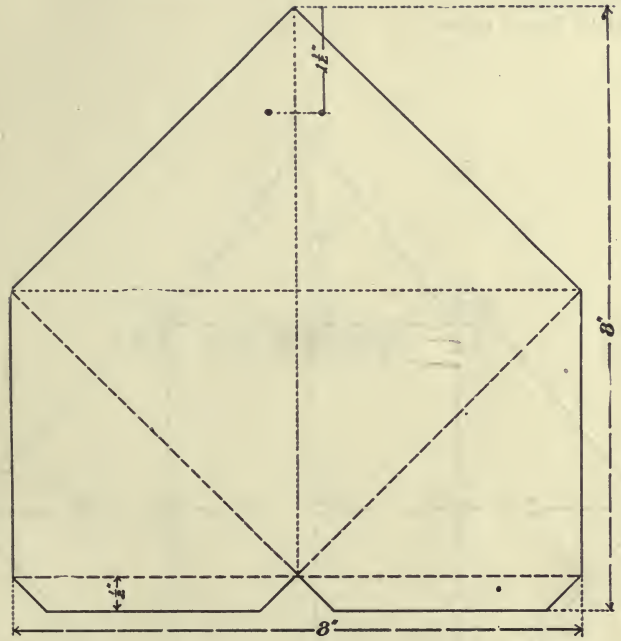
Score and fold on dashed lines.

Lace front with floss as shown in sketch.

Put in floss to hang model on, as indicated in drawing.

Material: Tagboard.




1½"
8"
2"
8"

B3 COURSE.

No. 9. Envelope.

Construction:

Draw a rectangle 4"x3".

Find middle points x and with ruler draw along and across the rectangle.

With ruler extend lines A, A, A, A, ½" outside rectangle.

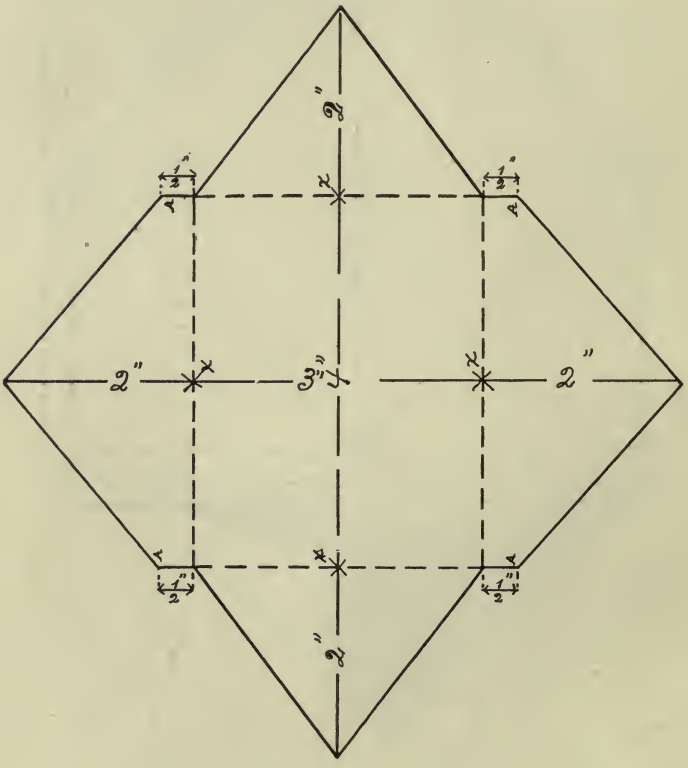
Measure 2" on lines X, X, X, X, and connect with points A, A, A, A; and at the ends of rectangle, as shown in drawing.

Cut around figure on the full lines.

Score on dashed lines and fold in on the lines.

No pasting.

Material: Cover paper.



A3 COURSE.

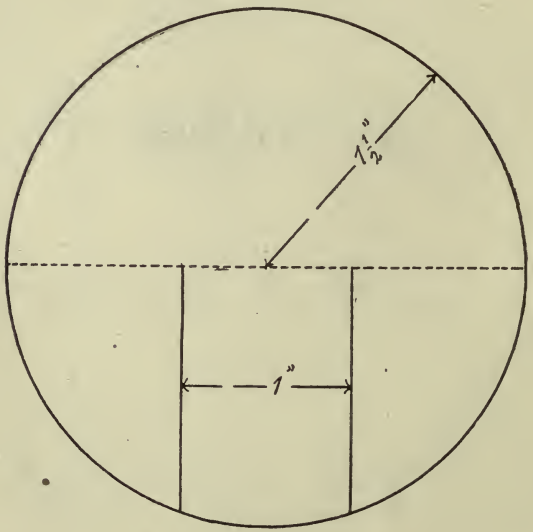
A3 COURSE.

No. 1. Bookmark.

Construction:

Using compasses draw circle with 1½" radius.
Draw diameter.
Measure ½" on each side of center.
With triangle draw lines AB, and CD, at right angles with the diameter.
With scissors cut around circumference.
Cut along lines BA, and DC, to diameter.
Drill carefully concepts or elements of circle.

Materials: Bristolboard or tagboard.



A3 COURSE.

No. 2. Triangular Keytag.

Construction:

With ruler draw line AB, 3" long.

Using A and B as centers and AB as radius with compasses draw arcs to intersect above AB at C.

With ruler draw lines AC and BC.

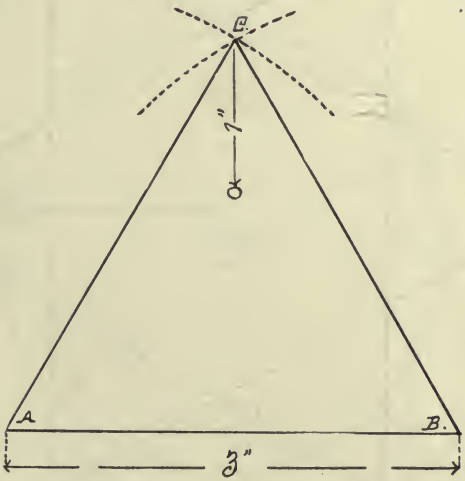
Cut triangle with scissors.

Measure 1" down from apex of triangle.

Bore hole with point of scissors.

Attach thread or floss.

Material: Tagboard.



A3 COURSE.

No. 3. Thread-winder.

Construction:

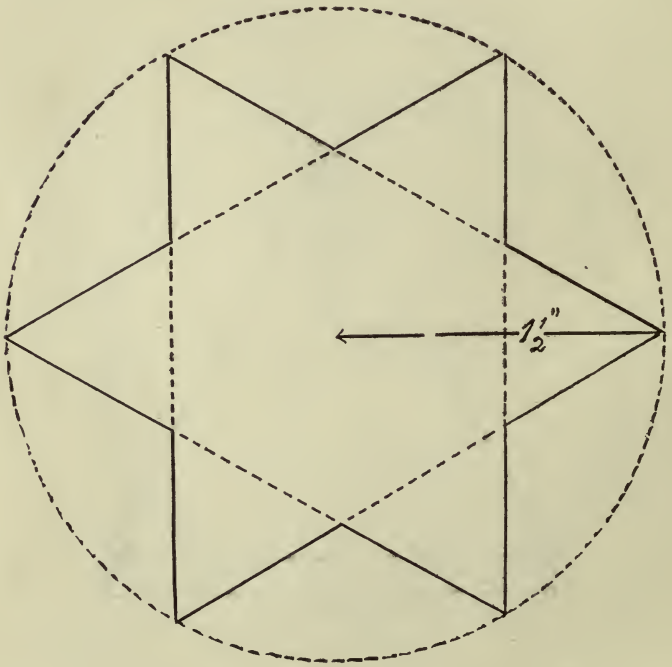
With compasses draw circle 1½" radius.

Divide circumference into six equal parts. Radius "goes around circumference 6 times."

Connect points, thus obtaining two equilateral triangles inscribed in a circle.

Cut out figure with scissors.

Material: Tagboard.



A3 COURSE.

No. 4. Pen Wiper.

Construction:

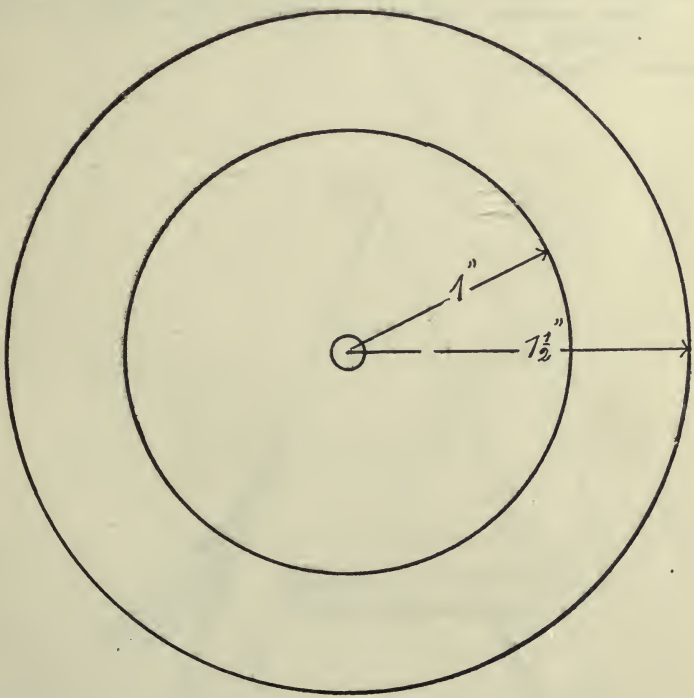
On bristolboard draw circle 3" diameter.

On blotting paper—of different colors, if possible—draw three circles 3" diameter. On bristolboard draw a circle 2" diameter.

Cut out circles with scissors.

Fasten together pieces with one paper fastener inserted in center, placing the large circle of bristolboard at the bottom, the small circle of bristolboard at the top.

Suggest that pupils *may* cut out pieces of cloth of same size, at home, thus furnishing themselves with penwipers.



A3 COURSE.

No. 5. Easel.

(Isosceles triangle.)

Construction:

Draw base line 3½" long.

With compasses draw arcs 1 and 2,—4¼" radius.

Draw sides of triangle.

Measure 1" from base line and draw line XX and place points 3 and 4,—½" from sides of triangle.

Measure ½" on base line and connect these points with points 3 and 4.

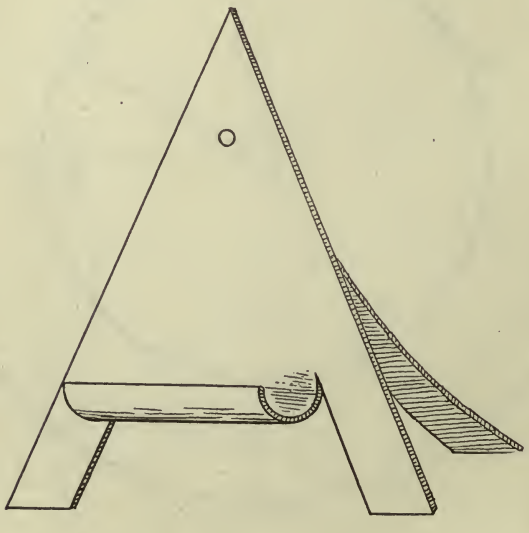
Draw lines 3, 5 and 4, 6,—½" long using triangle, then connect points 5 and 6.

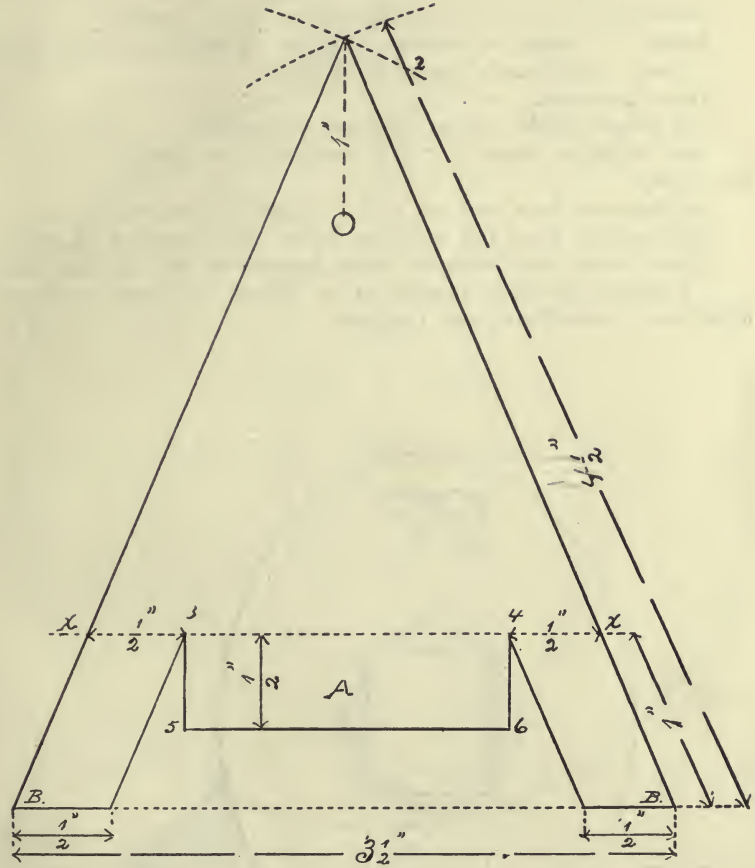
Cut out figure with scissors.

Roll flap A forward and upward, making a " rest " to hold picture on as in sketch.

For back supporter, draw and cut a piece of tagboard 3½"x½" and fasten the same with paper fasteners 1" from apex, as shown in drawing.

Material: Tagboard.




1"
2
4 1/2"
X
1/2"
3
4
1/2"
X
1"
2
A
5
6
1"
B.
B.
1"
2
1"
2
3 1/2"

A3 COURSE.

No. 6. Circular Picture Frame.

Construction:

On bristolboard draw circle 4" diameter.

Draw diameters, as in drawing.

Measure ½" on both sides of vertical diameter and at any distance above and below horizontal diameter; obtaining points A, B, C, D.

Draw lines A, C, and B, D, indefinitely, as in drawing.

Measure ½" below and above horizontal diameter and draw cross lines, completing a square of 1" sides.

Draw diagonals.

Cut around circle, and in diagonals of square.

Roll triangular pieces 1, 2, 3, 4, outward as in sketch.

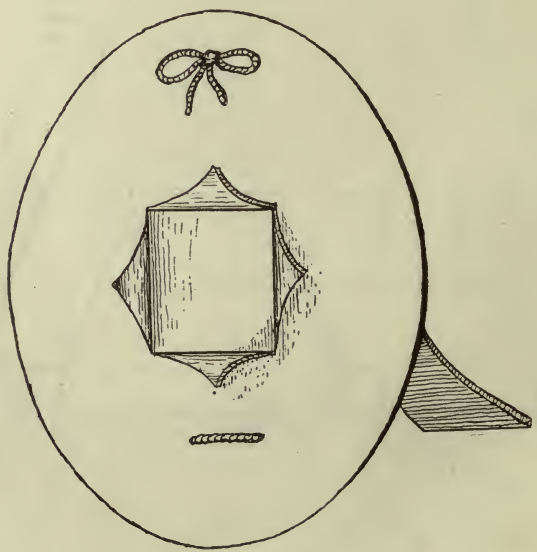
For back:

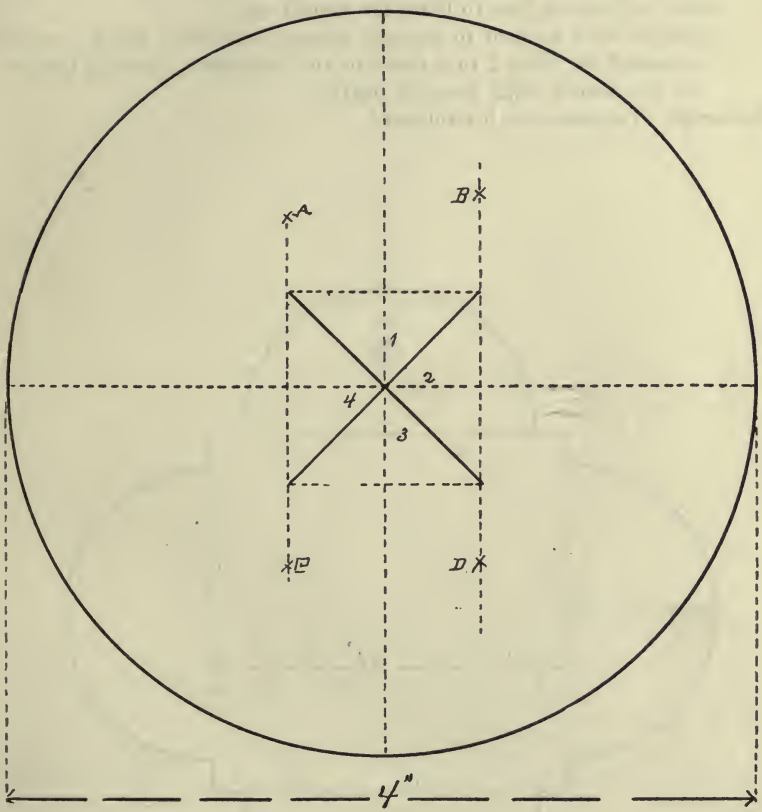
On tagboard draw and cut a circle same size as first.

On tagboard draw and cut piece 2½"x1" for supporter of frame.

Fasten with floss the three pieces together at the top; and back and front fastened together at the bottom, as shown in sketch.

Materials: Bristolboard and tagboard.




A
B
C
D
1
2
3
4
4"

A3 COURSE.

No. 7. Calendar Mount.

(Quatrefoil.)

Construction:

Draw a square $2\frac{1}{2}$" sides.

From middle of the sides draw semicircles 1" radius.

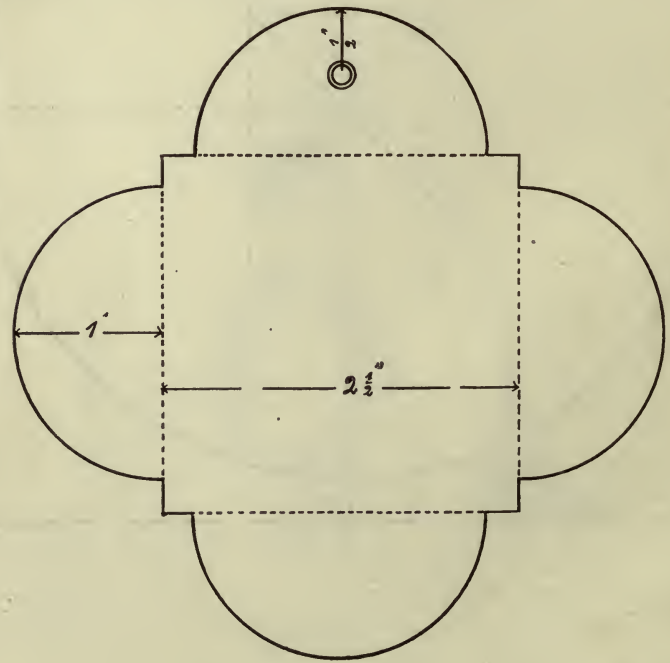
Cut out figure with scissors.

Punch hole and press in eyelet as shown in drawing.

Insert a piece of floss to hang the mount on.

Children may be told to procure a small calendar, which can be obtained for from 2 to 5 cents in any bookstore. Fasten this on to the mount with floss or paste.

Material: Tagboard or bristolboard.



A3 COURSE.

No. 8. Wallpocket.

Construction:

Draw line A, B, 3", and on it with compasses construct equilateral triangles, above and below.

On the sides of triangle C construct triangles D, E.

At middle points x, x, draw perpendiculars ½", and draw slanting lines as in drawing.

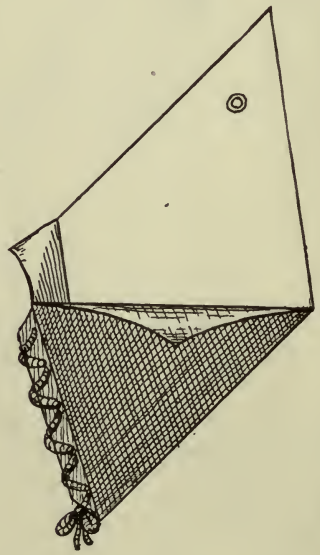
Draw flap lines, 1 and 2, ½" below triangles.

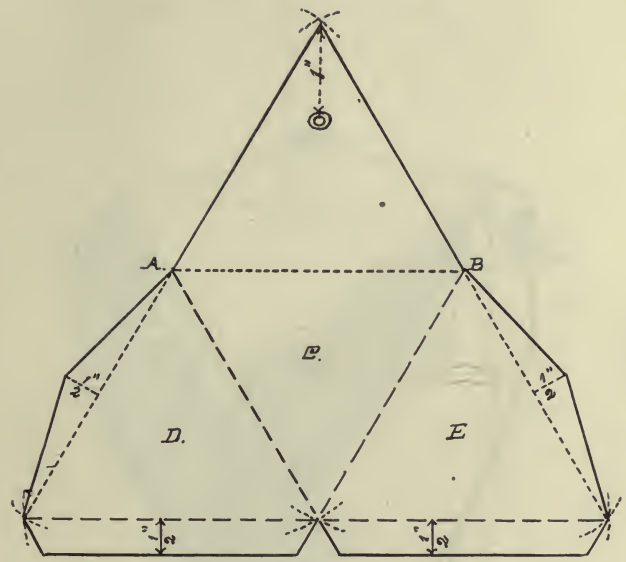
Score and fold on dashed lines as in drawing.

Punch hole and press in eyelet, 1" from apex.

Lace front with floss as in sketch, and bend triangular top pieces outward as shown in sketch.

Material: Bristolboard or tagboard.




A
B
D.
E.
E

A3 COURSE.

No. 9. Toothpickholder.

Construction:

Draw a line 2" long and on it construct an equilateral triangle, apex down.

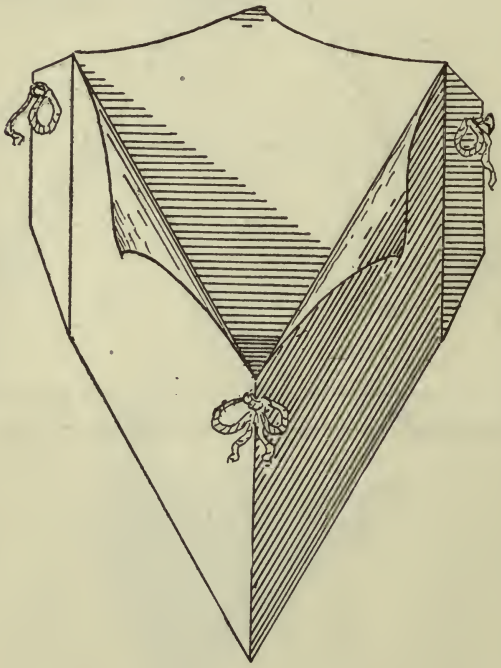
On sides of triangle draw squares.

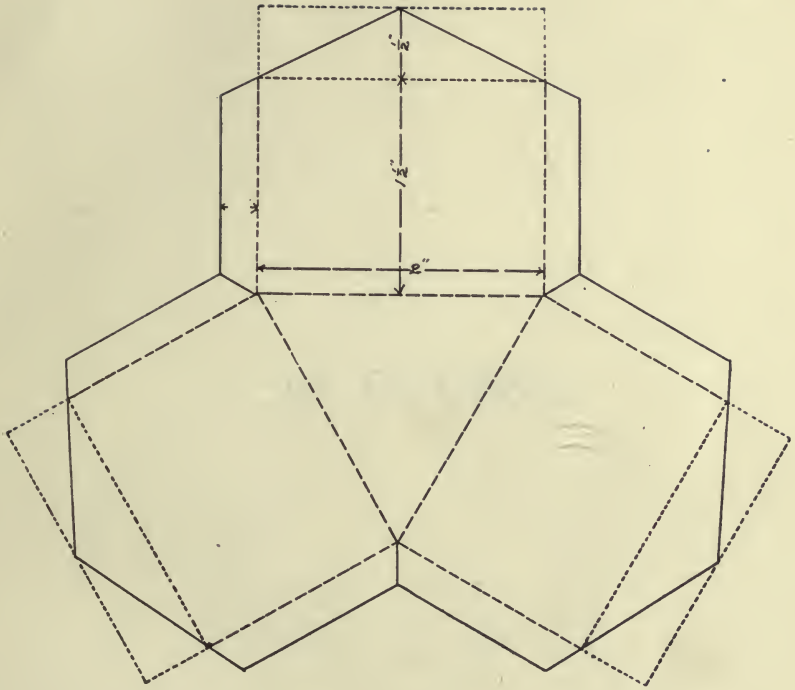
Draw lines x, ½" from top side, find middle and draw points as in drawing. Add flap lines ¼" from outside of squares.

Cut on full lines. Score and fold on dashed lines. Fold flaps outward and fasten with floss, as shown in sketch.

Roll points over pencil outward as shown in sketch.

Material: Tagboard.




½"
1½"
2"

B4 COURSE.

B4 COURSE.

No. 1. Open Box.

Construction:

Draw a rectangle 7"x5".

Draw lines 1" inside and parallel to sides of rectangle.

Draw ¼" flap lines in the corner squares.

Produce the diagonal of corner squares and the same will cut flap lines obliquely as shown in drawing.

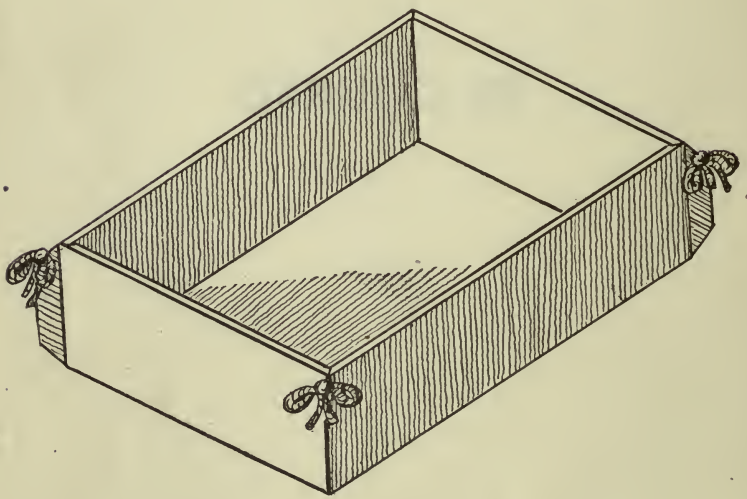
Cut around figure on the full lines.

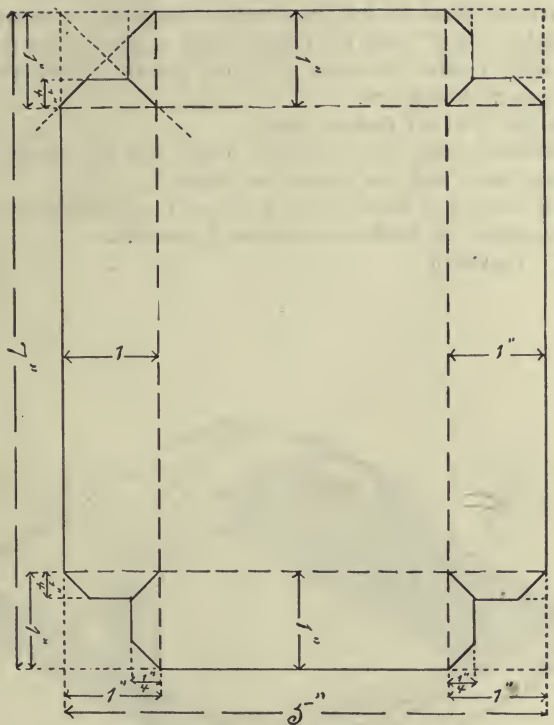
Score on dashed lines.

Fold sides of box inward.

Fold flaps outward and fasten corner with floss as shown in sketch.

Material: Tagboard.




1"
1"
1"

B4 COURSE.

No. 2. Oblong Basket.

Construction:

Draw rectangle 5½"x4".

Draw lines inside, parallel to and 1" from sides of rectangle.

Draw diagonals in corner squares.

From the corners, measure ½" in both sides of the rectangle.

Connect these points with oblique lines.

From same points draw lines to corners of inside rectangle, as shown in the drawing.

In middle of the long sides locate ½" lines for handle.

Cut around figure on full lines and on diagonals of corner squares.

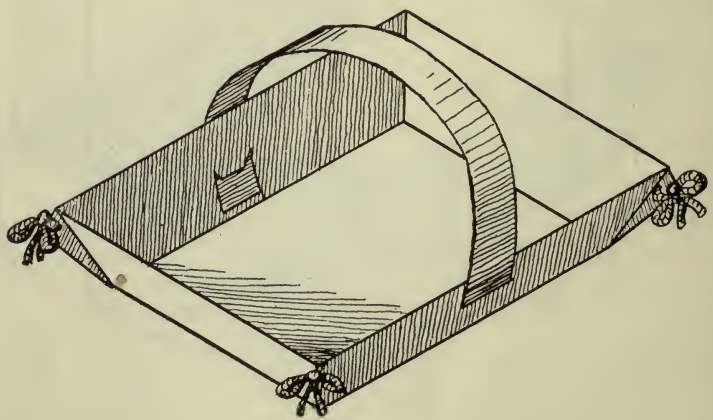
In cutting the ½" lines for handle, bore a hole in the ends with a darning needle, compass or other pointed instrument, before cutting with scissors.

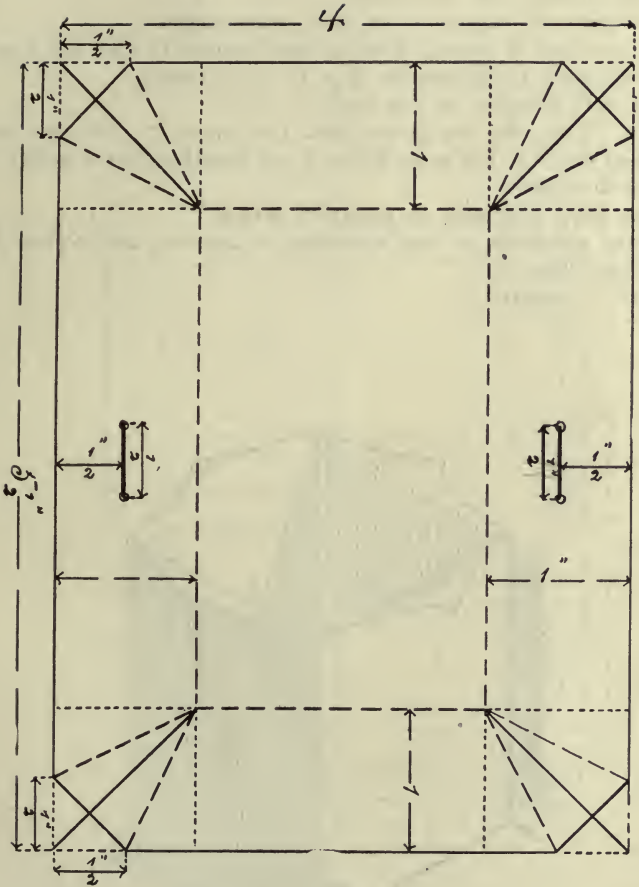
Score and fold on dashed lines.

For handle, draw and cut piece 9"x½" and cut slanting notches 1" from each end, as shown in sketch.

Fasten corners of basket with floss and insert handle from around the outside of basket, as shown in sketch.

Material: Tagboard.




4
1"
2
1"
2
1"
2
1"
2
1"
2
1"
2
1"
2
1"
2

B4 COURSE.

No. 3. Square Toothpickholder.

Construction:

Draw rectangle 6"x2".

Divide into spaces of $1\frac{1}{2}$".

Draw line AB, $\frac{1}{2}$" from top side, and divide each space into two equal parts ($\frac{1}{4}$").

Draw oblique line for points.

Add lines for flaps of $\frac{1}{4}$" at ends of rectangle.

On end line of second division draw square C, and add lines on two sides for standards of A $\frac{1}{2}$" as in sketch.

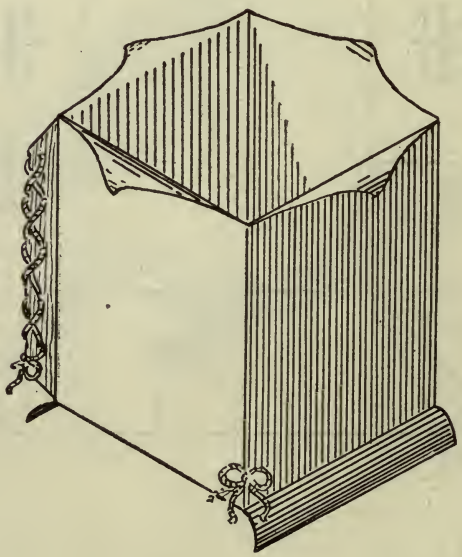
Cut with scissors on full lines.

NOTE. Take care not to cut loose the square C. Do not score or fold line AB, but after figure is put together, curve points over as in sketch.

Lace flaps with floss, as shown in sketch.

Curve standards or legs according to drawing, and do not score these lines.

Material: Tagboard.



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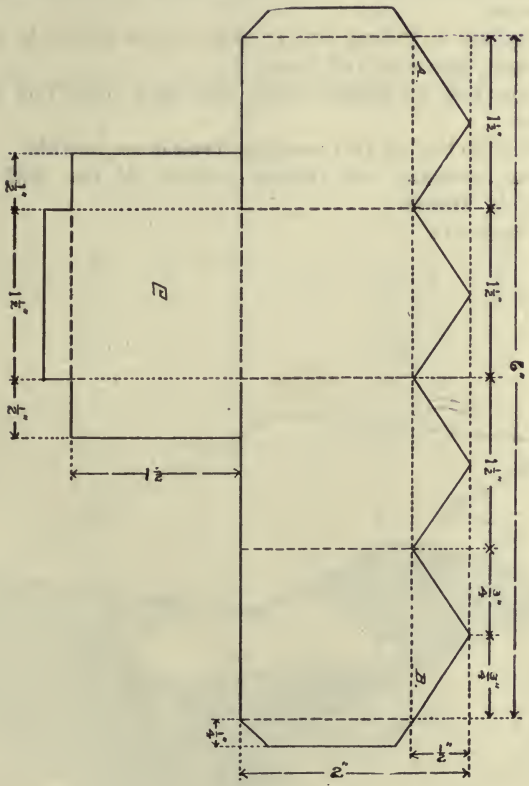


B4 COURSE.

No. 4. Covered Box.

Construction:

Draw rectangle A, B, C, D, 10"x3".

Space and draw lines across at distances indicated in the drawing, and extending lines 2, 7, and 3, 6, to form side of rectangles R, R.

Draw flaps 1, 2; 3, 4; 5, 6; 7, 8; each ¼" from the sides of the rectangles.

Draw the tongue x, ½" wide, measuring 1¼" from each side of rectangle.

Draw slot-line S, ½" long and ½" from side as shown in drawing.

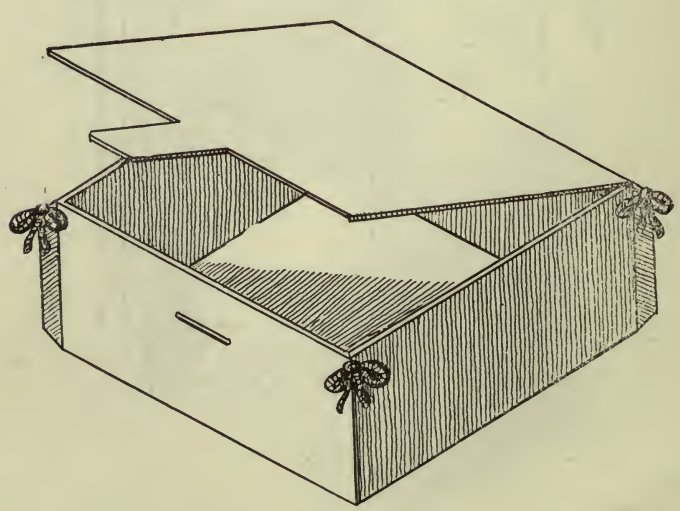
Cut around figure on full lines.

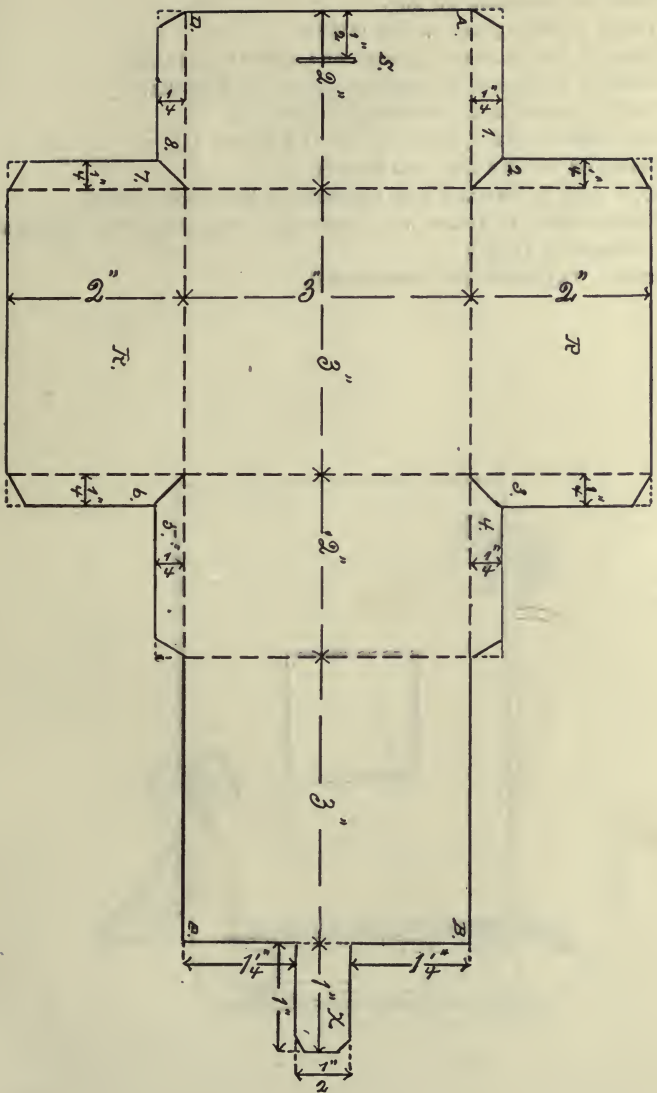
Score and fold on dashed lines, and split open line S, for the tongue.

Fold sides of box so that scorings remain on outside.

Fold flaps outward, and fasten corners of box with floss, as shown in sketch.

Material: Tagboard.




2"
3"
2"
3"
3"
2"
3"
1¼"
1"
1"
1¼"
1"
½"

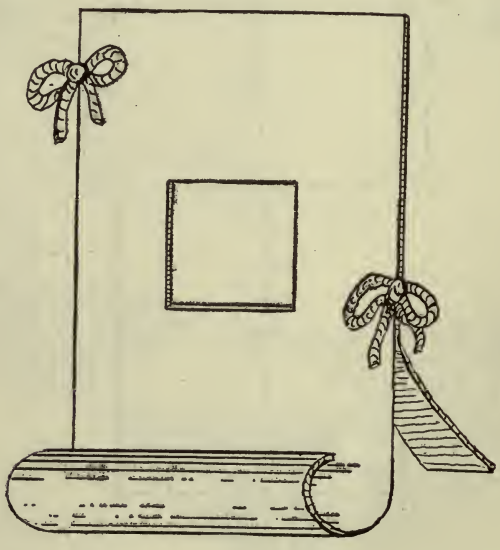
B4 COURSE.

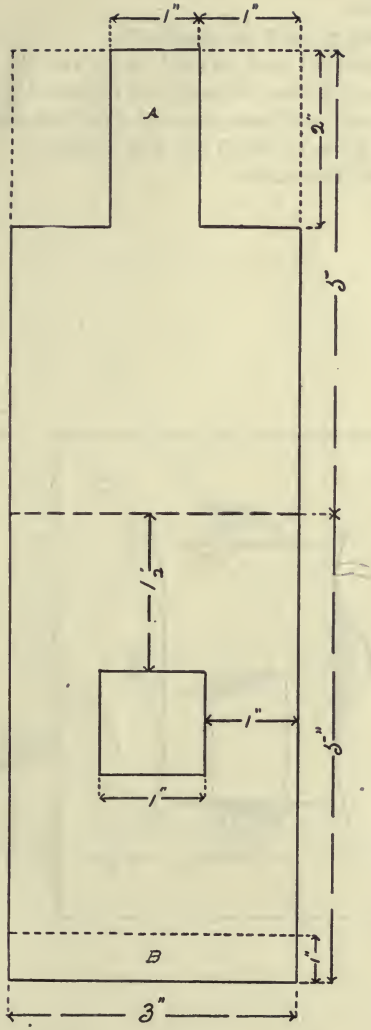
No. 5 Pictureframe.

Construction:

Draw a rectangle 10"x8".
Draw a line across in the middle.
Draw a line across 1" from one end of rectangle.
Draw a square of 1" sides as shown in drawing.
Draw supporter A according to drawing.
Cut around figure, and cut out the square.
Score on middle line and fold on it.
Roll part B forward and upward as shown in sketch.
Fasten sides of frame with floss and bend supporter backward as shown in sketch.

Material: Tagboard or bristolboard.



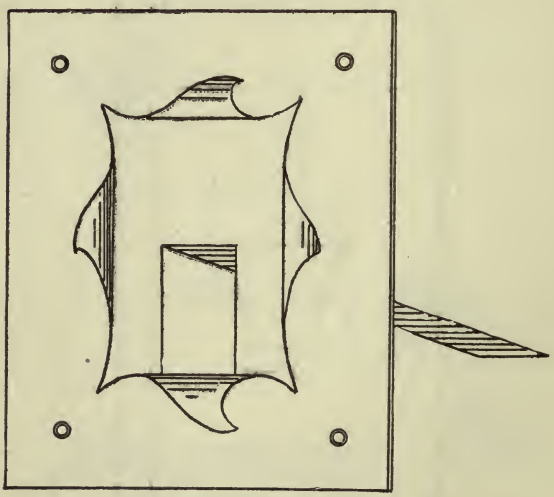

1"
1"
A
2"
5"
1½"
1"
1"
3"
B
1"
3"

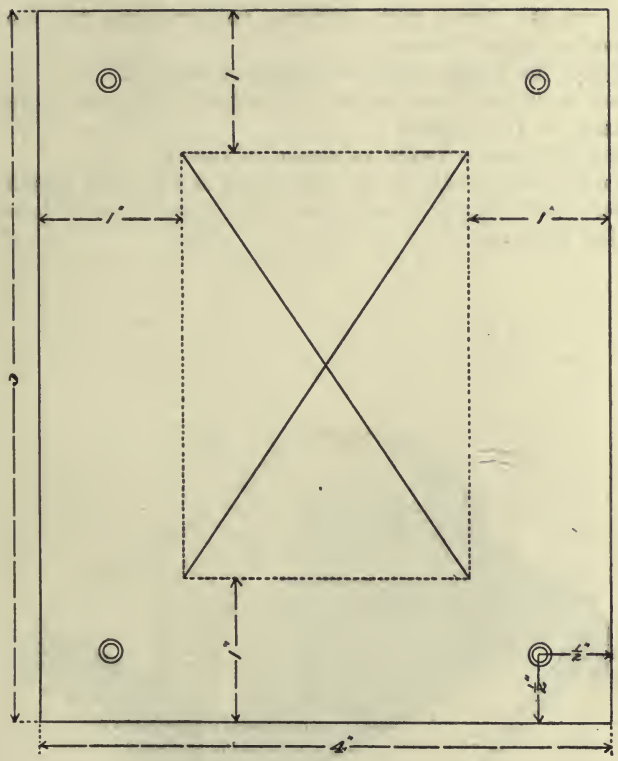
B4 COURSE.

No. 6. Pictureframe.

Construction:

For front piece, draw rectangle 4"x5", on bristolboard.
Draw inside rectangle 1" from sides.
Draw diagonals.
Cut around figure and on diagonals.
Roll points forward and upward as in sketch.
For back piece, make rectangle on tagboard same as front piece.
Draw, cut, and bend back support 3"x1" as shown in sketch.
Fasten back piece to the front with eyelets.
No scoring on this model.




1"
1"
1"
3"
4"

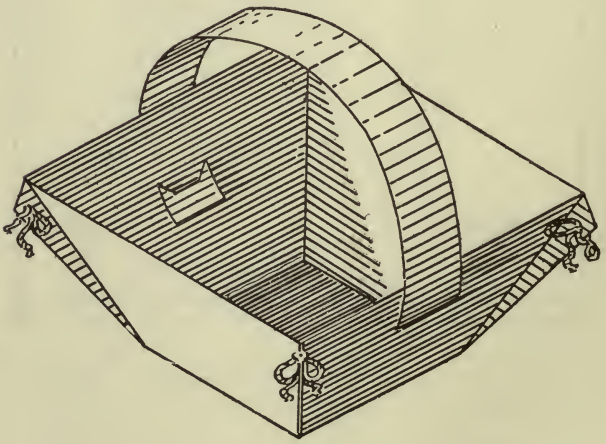
B4 COURSE.

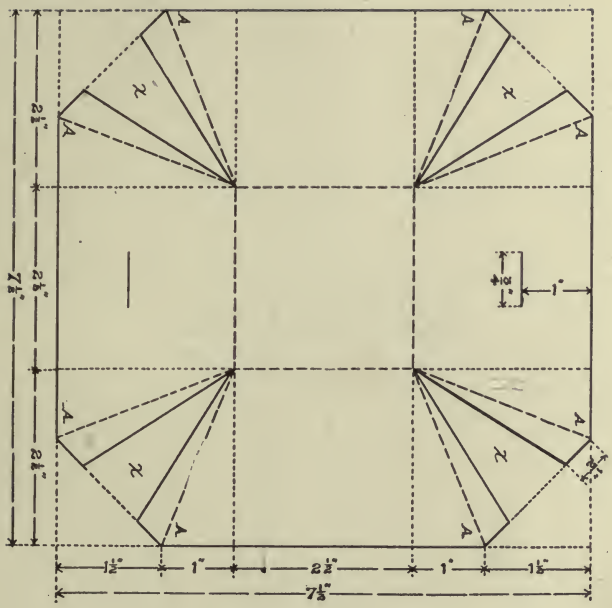
No. 7. Basket.

Construction:

Draw a square 7½" sides.
Draw lines across vertically and horizontally 2½" apart.
Place point A, 1" from inside lines as shown in drawing.
Connect these points with oblique lines.
On these oblique lines place points ½" from points A.
Draw lines to the opposite angles of the corner square.
Locate ¾" lines for handle as in drawing.
Cut out the figure with scissors, following the full lines and scoring corner pieces x.
Cut hole for handle with small point of scissors.
Score on dashed lines and fold the paper so that the scored lines come on the outside.
Fold flap pieces outward as shown in sketch.
Draw and cut handle 12"x¾" and insert as shown in sketch.
Fasten with floss as in sketch or with eyelet in each corner.

Material: Tagboard.




A
x
2½"
2½"
2½"
7½"
1"
1½"
1"
2½"
1"
1½"
7½"

A4 COURSE.

A4 COURSE.

No. 1. Cornucopia.

Construction:

With ruler draw line, AB, 9" long.

With triangle draw line CD, 4" long and at right angles to and 3" from end of line AB.

Connect C and D with B.

With compasses draw arc through C and D with B as center, and B D or C D as radius.

On the arc set off distance equal to C D.

Draw F B and E B.

Draw A C and A D.

On A, C and A, D draw semicircles 1 and 2, with ½" radius and 1" from C and D.

Draw lines 3 and 4 for flaps ¼".

Cut around figure with scissors on the full lines.

Score on dashed lines.

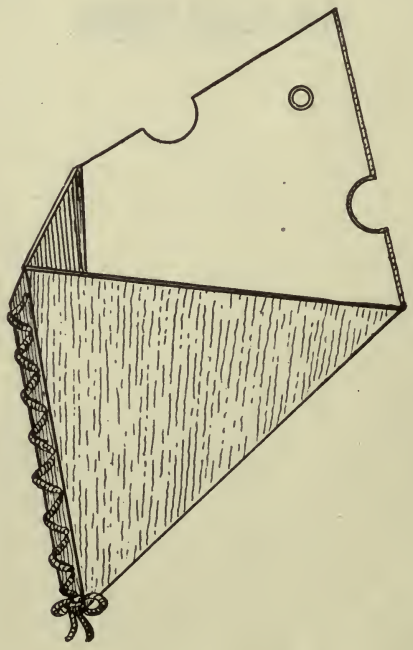
Fold figure inward on lines.

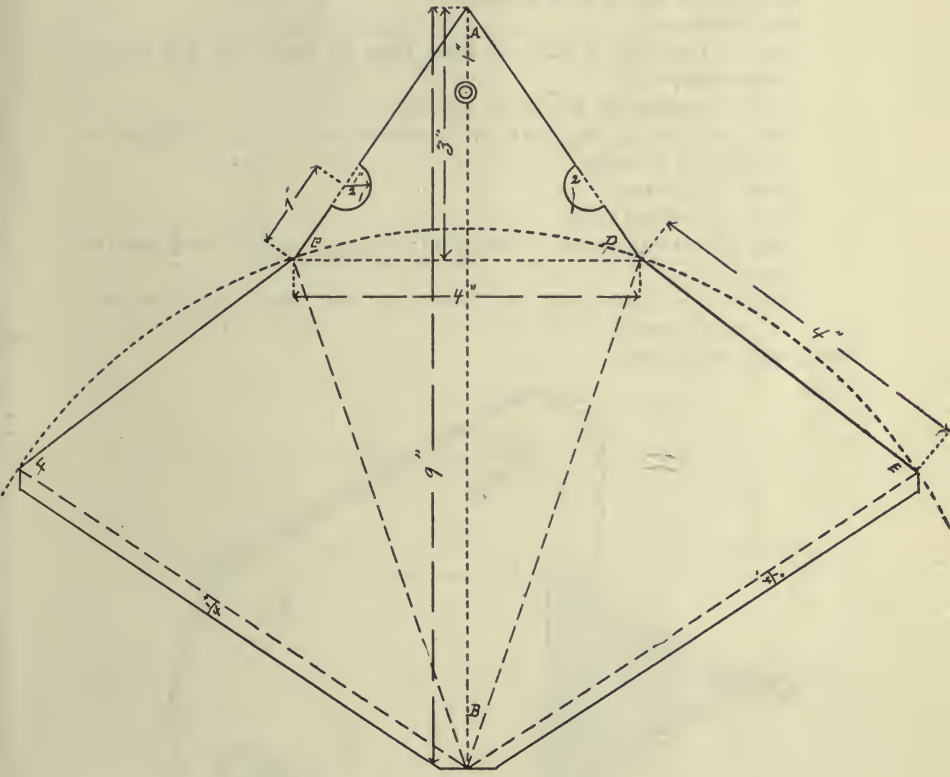
Fold flaps outward.

Sew flaps in front of pocket ("Linen Floss" or "Columbia Zephyr") double overcasting or lacing.

Punch hole in top, 1" from apex, and press in eyelet with punch.

Material: Tagboard.




3"
4"
9"
4"

A4 COURSE.

No. 2. Wallpocket.

Construction:

For back of model—

Draw a rectangle 5"x4".

Draw oblique lines in top corners ½" from the angles as indicated in drawing.

Locate points for eyelets 1" from end and ½" from top lines of rectangle.

Cut around figure with scissors.

For pocket—

Draw a rectangle 8"x2" and draw lines 2" from ends and across rectangle.

Draw diagonals as shown in drawing.

Add flap lines to diagonals and to base line of the rectangle, as shown in drawing.

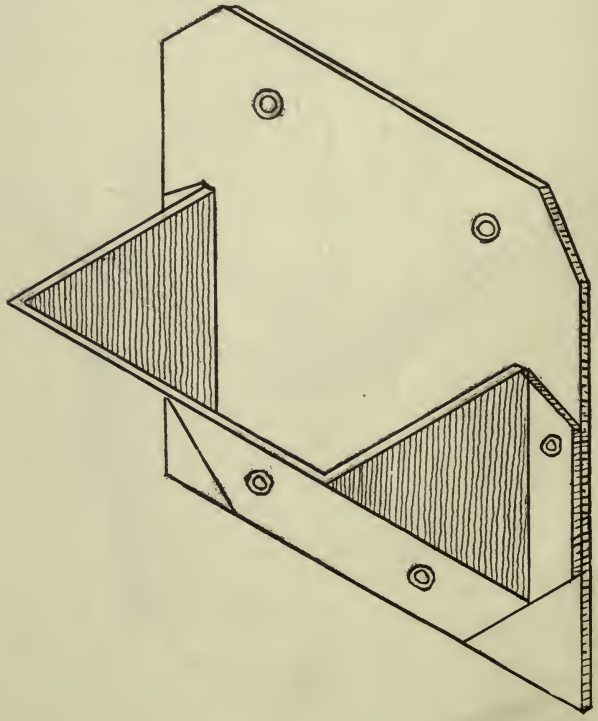
Cut on full lines.

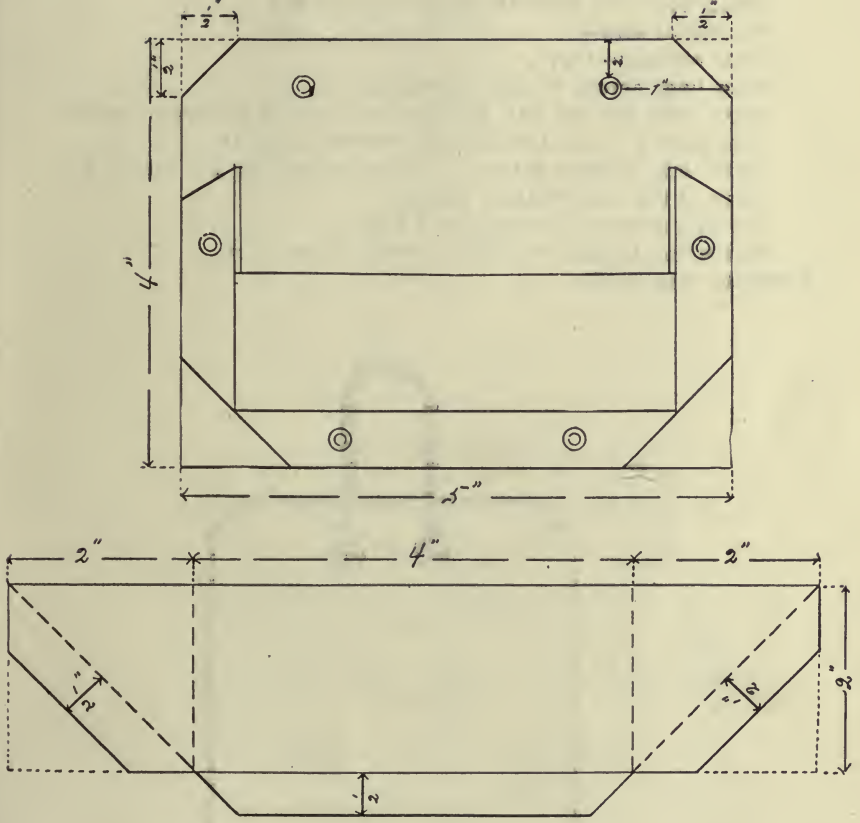
Score on dashed lines.

Fold and fasten pocket to back piece using eyelets, as shown in sketch.

Punch holes and press in eyelets in back piece in points previously located.

Material: Tagboard.




1/2"
1/2"
2"
2"
1"
4"
5"
2"
4"
2"
2"
2"
2"
2"
2"

A4 COURSE.

No. 3. Matchsafe.

Construction:

For back of safe—

Draw rectangle 4"x5½".

Draw oblique lines in top corners, ½" from angle as in drawing.

Locate holes in middle of top 1" apart and ½" from top line.

Cut out figure with scissors.

Punch holes and press in eyelets as in sketch.

For box of safe—

Draw rectangle 1"x7".

Draw lines across ½" from each end.

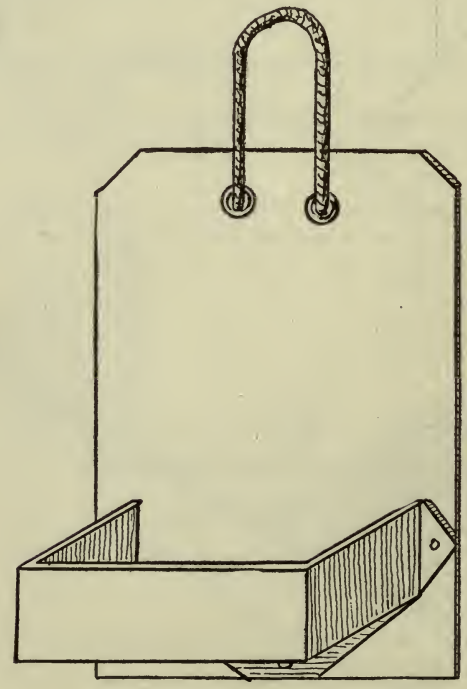
Draw lines AB and CD, 2" from each end of rectangle and extending 2½" as in sketch, then connect B and D.

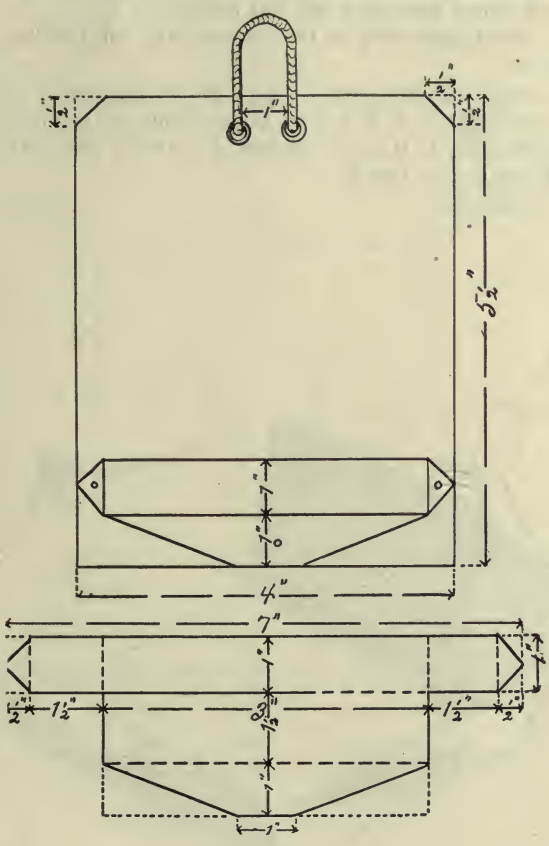
Divide into definite spaces to obtain proportions for bottom and flap of box, according to drawing.

Cut with scissors, score and fold figure.

Fasten box to back with floss, eyelets or fasteners.

Material: Tagboard.




1"
5½"
4"
7"
1½"
1½"
1½"

A4 COURSE.

No. 4. Tray.

Construction:

Draw a square 5" sides. Draw another square 3" sides by measuring 1" from each side of first figure.

Place points ½" from each side of outside square and draw oblique lines to angles of inside square as shown in drawing.

Draw triangles A, B, C, D, ¾" altitude. Note points of connection.

Cut out figure following the full outline.

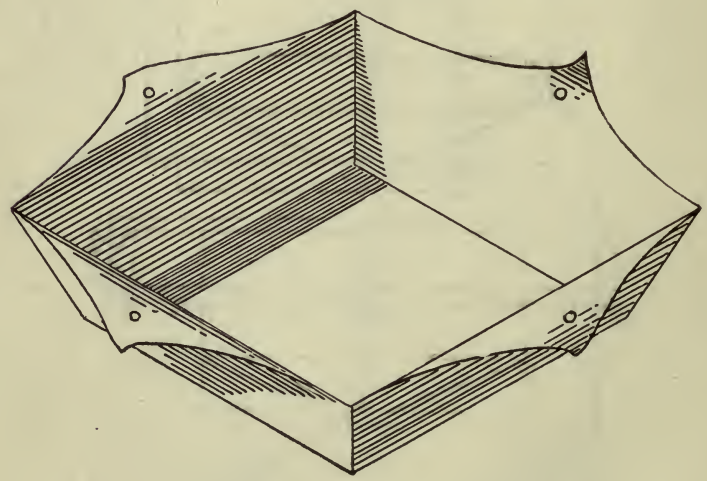
Score on dashed lines in the corners and on the lines of inner square.

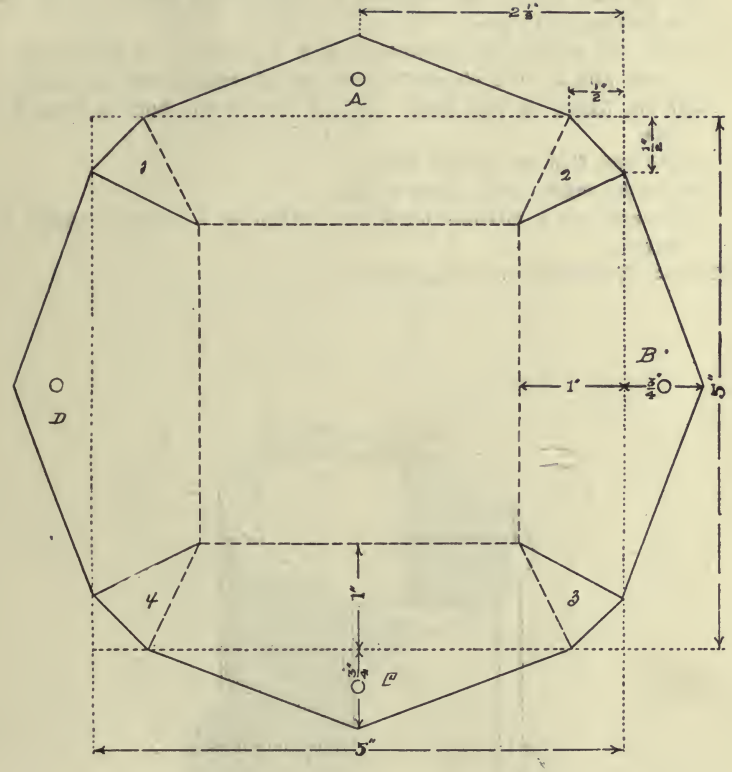
Fold sides upward and apply paste on under side of triangular flaps 1, 2, 3, 4, and fasten same on inside of tray.

Bend triangles A, B, C, D, out and downward as in sketch.

Punch holes with punch.

Material: Tagboard.




2 1/8"
A
1/2"
1
2
B
D
1"
3/4"
5"
4
1"
3
3/4"
C
5"

A4 COURSE.

No. 5. Hexagonal Toothpickholder.

Construction:

Draw a rectangle 6"x2".

Divide into six equal spaces, drawing lines across.

Draw line A, ¼" from top of rectangle, and draw points as shown in drawing.

Draw line, B, ¼" below figure obtaining flap lines for bottom.

Draw ¼" flap line at the end.

On the base line of one division is rectangle draw arcs 1 and 2—radius equal to line.

From the center thus obtained and with same radius draw a circle and on the circumference set off spaces for hexagon.

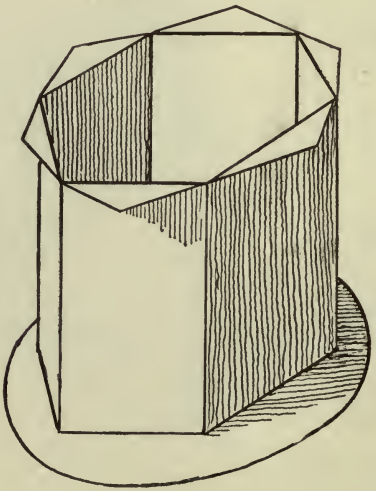
Cut out figure on full lines. Do not cut off the bottom from the line.

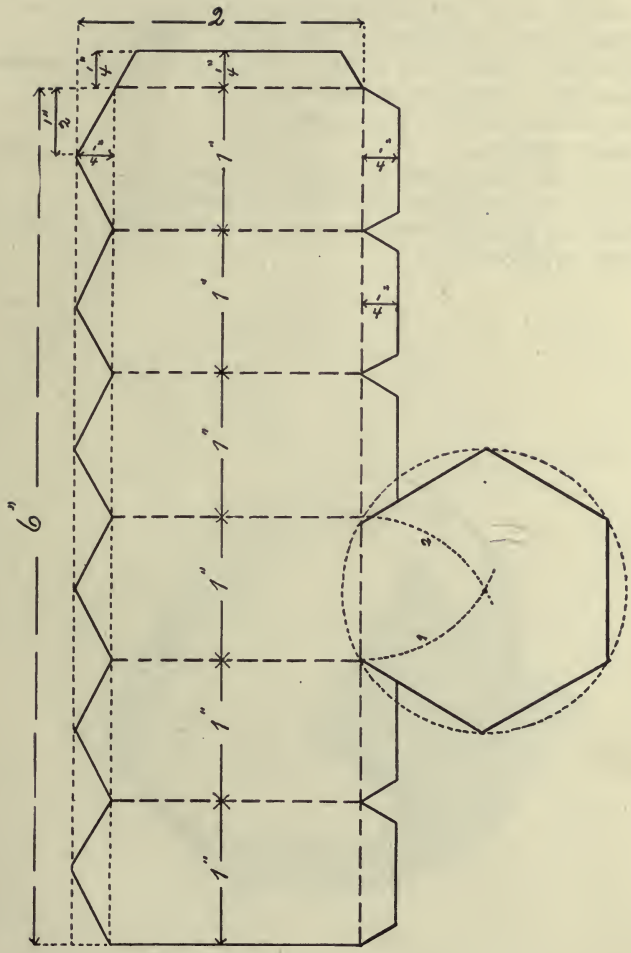
Score and fold on dashed lines.

Paste the model with flaps inside.

Draw and cut a circular piece and attach as a base, as shown in sketch.

Material: Tagboard or bristolboard.




2
6"
1"
1"
1"
1"
1"
1"
1"
1"
1"
1"
1"
1"
1"

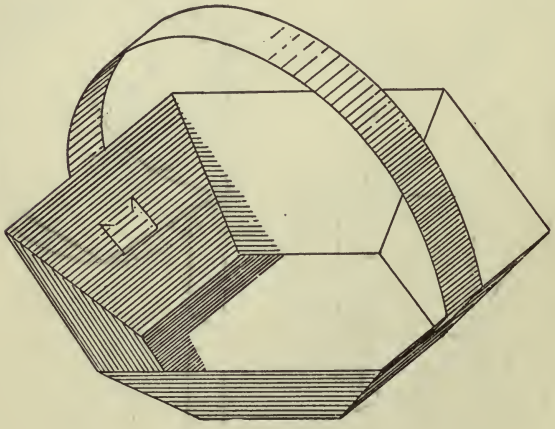
A4 COURSE.

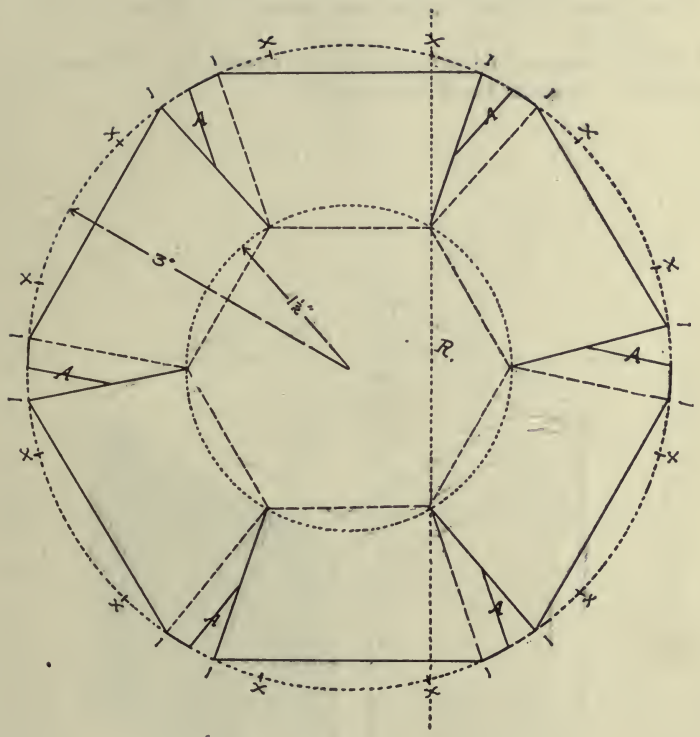
No. 6. Basket.

Construction:

Draw two concentric circles 1½" and 3" radius respectively.
Construct and draw the sides of the hexagon in smaller circle.
Place the ruler across two opposite angles and obtain points x, as shown in the drawing by dotted line R.
Measure with compasses, ½" and obtain points 1.
Draw lines from these points to the angles of the hexagon.
Measure ¼" and draw flap lines A.
(On circles, space with compasses.)
Connect points 1.
Cut on full lines, score on dashed lines and fold.
Fasten flaps with paste on inside of basket.
Make the handle ½" wide and paste it to the inside of basket.

Material: Tagboard.




X
1
A
3"
1½"
R.

A4 COURSE.

No. 7. Bank.

(Cube.)

Construction:

Draw rectangle A B, 9"x2½", and divide into four equal parts.

Draw the squares C, D. Draw flap lines ¼" as shown in drawing.

Cut on full black lines.

Score and fold on dashed lines.

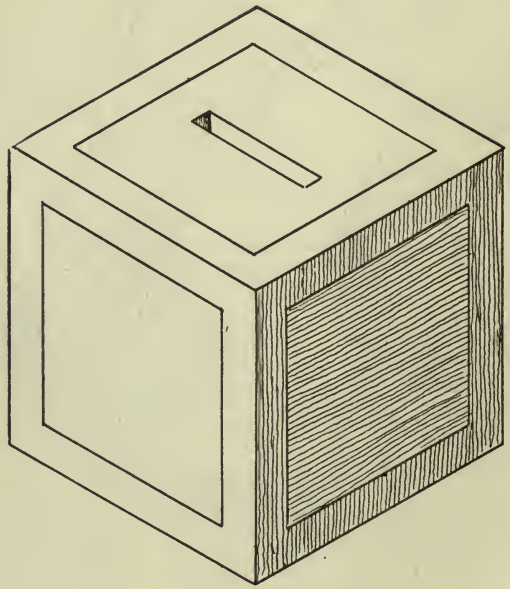
In one square draw and cut the opening X.

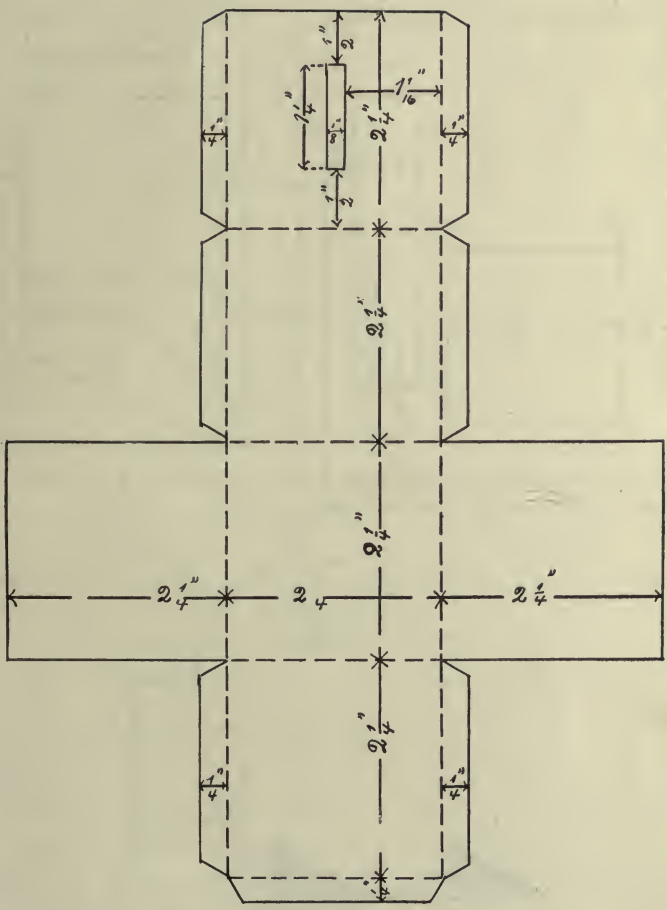
Fasten with paste, placing flaps on inside.

Cut pieces of fancy paper and attach to surfaces as shown in sketch.

Teach concepts of cube,—surfaces, edges, and solid angles.

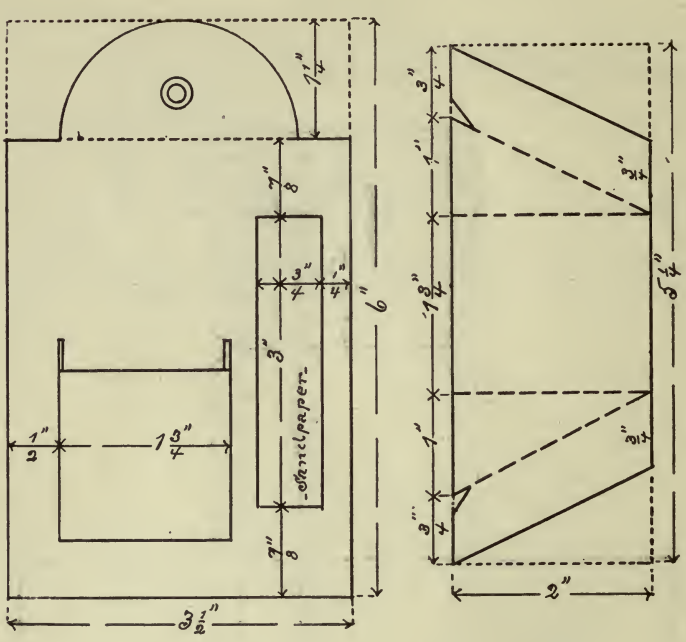
Materials: Tagboard and fancy paper.

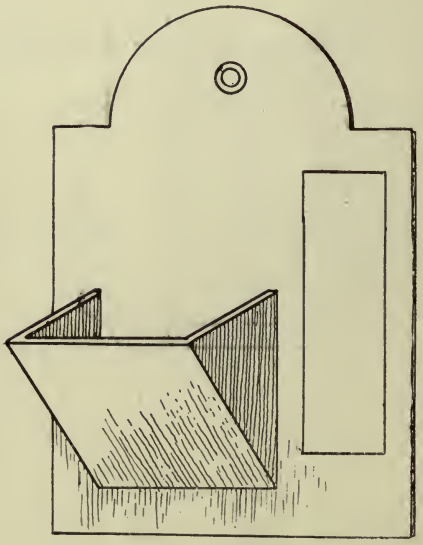



1"
2
1 1/16"
1 1/4"
2 1/4"
1/4"
1/4"
1"
2
2 1/4"
2 1/4"
2 1/4"
2 1/4"
2
2 1/4"
2 1/4"
1/4"
1/4"
1/4"

SUPPLEMENTARY MODEL.

Matchsafe.





INDEX.

	PAGE.
Cutting	7
Folding	7
General directions	4-5
How to cut sandpaper	9
Introduction	3
Materials and tools	8
Materials	9
Original and supplementary work	8
Pasting	7
Paste	8
Preface	2
Suggestions in method of teaching	6
Scoring	7
System of lines	10
Terminology	7
B3 Course	11-24
No. 1—Square card	12
No. 2—Visiting card (rectangle)	13
No. 3—Windmill	14-15
No. 4—Notebook	16-17
No. 5—Visiting card (Rhombus)	18
No. 6—Visiting card (Rhomboid)	19
No. 7—Cardcase	20
No. 8—Wallpocket	22-23
No. 9—Envelope	24
A3 Course	25-39
No. 1—Circular bookmark	26
No. 2—Triangular keytag	27
No. 3—Threadwinder	28
No. 4—Circular penwiper	29
No. 5—Easel (Isosceles triangle)	30-31
No. 6—Circular picture frame	32-33
No. 7—Calendarmount (quartrefoil)	34
No. 8—Wallpocket	36-37
No. 9—Triangular toothpickholder	38-39

B4 Course 41-55
No. 1—Open box 42-43
No. 2—Oblong basket 44-45
No. 3—Square toothpickholder 46-47
No. 4—Covered box 48-49
No. 5—Picture frame 50-51
No. 6—Picture frame 52-53
No. 7—Square basket 54-55

A4 Course 57
No. 1—Cornucopia 58-59
No. 2—Wallpocket 60-61
No. 3—Matchsafe 62-63
No. 4—Tray 64-65
No. 5—Toothpickholder (hexagonal) 66-67
No. 6—Basket (hexagonal) 68-69
No. 7—Bank (cube) 70-71
Supplementary model (matchsafe) 72

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